Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

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1. (Currently Amended) A ~~frame synchronization apparatus and~~ method for an apparatus receiving [[using]] an optimal pilot pattern, comprising ~~the steps of~~:

storing column sequences demodulated and inputted by slots, in a frame unit, in detecting at least one of channel estimation and frame synchronization for at least one of upward and downward link channels;

converting the stored column sequences according to a pattern characteristic related to each sequence by using the pattern characteristic obtained from the relation between the column sequences;

adding the converted column sequences by slots; and

performing a correlation process of the added result to a previously designated code column.

2. (Currently Amended) The method as claim 1, wherein said converting step comprises ~~the steps of~~ shifting, reversing and inverting the single column sequence to thereby generate the remaining column sequences.

3. (Currently Amended) ~~A frame synchronization~~ An apparatus [[using]] recieving an optimal pilot pattern comprising:

a memory mapping/addressing block for converting column sequences inputted/demodulated by slots according to a defined pattern characteristic based on a relation between the column sequences;

an adder for adding the converted outputs from the memory mapping/addressing block; and

a correlator for performing a correlation process of the added result to a previously designated code column.

4. (New) The method of claim 1, wherein the relation is based on the following:

$$\overset{\alpha}{\underset{i=1}{Q}} R_{c_i}(\tau) = \begin{pmatrix} \alpha \cdot 15, \tau = 1 \\ -\alpha, \tau \neq 0 \end{pmatrix}$$

where $\propto = 1, 2, 3, \ldots, 8$ and $Rc_i(\tau)$ represents self correlation functions of each pilot sequence Ci, and $i \geq 1$.

5. (New) The method of claim 4, wherein the relation is further based on the following:

$$\sum_{i=1}^{\alpha/2}\left[R_{C_{2i-1},C_{2i}}(\tau)+R_{C_{2i},C_{2i-1}}(\tau+1)\right]=\begin{pmatrix}-\alpha\cdot 15, \tau=7\\ \alpha, \tau\neq 7\end{pmatrix}$$

where $\propto = 2, 4, 6, 8$ and Rc_i, c_j (τ) represents a cross-correlation function between a pair of code sequences in each class, and $i \geq 1$.

6. (New) The method of claim 4, wherein $2 \leq i \leq 8$.

7. (New) The apparatus of claim 3, wherein the relation is based on the following:

$$\sum_{i=1}^{\alpha} R_{c_i}(\tau)=\begin{pmatrix}\alpha\cdot 15, \tau=1\\ -\alpha, \tau\neq 0\end{pmatrix}$$

where $\propto = 1, 2, 3, \ldots, 8$ and Rc_i (τ) represents self correlation functions of each pilot sequence Ci, and $i \geq 1$.

8. (New) The apparatus of claim 7, wherein the relation is further based on the following:

$$\sum_{i=1}^{\alpha/2}\left[R_{C_{2i-1},C_{2i}}(\tau)+R_{C_{2i},C_{2i-1}}(\tau+1)\right]=\begin{pmatrix}-\alpha\cdot 15, \tau=7\\ \alpha, \tau\neq 7\end{pmatrix}$$

where $\propto = 2, 4, 6, 8$ and $Rc_i, c_j(\tau)$ represents a cross-correlation function between a pair of code sequences in each class, and $i \geq 1$.

9. (New) The apparatus of claim 7, wherein $2 \leq i \leq 8$.